

VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a Minor, Municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260 et seq. The municipal discharge results from treated sewage generated by a privately owned treatment works serving a population of approximately 450 people. This permit action consists of reissuing and updating the permit to reflect current VPDES policy and guidance.

1. Owner Name: The Tides Utilities LLC
Facility Name, Address & Location: The Tides Utilities South Wastewater Treatment Facility (WWTF)
480 King Carter Drive
Irvington, VA 22480
2. SIC Code: 4952
3. Permit No. VA0029351 Existing Permit Expiration Date: April 27, 2015
4. Owner Contact:
Name: Gordon Slatford
Title: General Manager
Telephone No: (804) 438-4451
5. Application Complete Date: 1/8/2015
Permit Drafted By: Laura Galli Date: 1/8/2015
Reviewed By: Adam Eller Date: 1/23/2015
Emilee Adamson Date: 2/11/15
6. Receiving Stream Name: Carter Creek
River Mile: 3-CTR001.14
Basin: Rappahannock River
Subbasin: N/A
Section: 1
Class: II
Special Standards: a
7-Day, 10-Year Low Flow (7Q10): not applicable to tidal discharges
1-Day, 10-Year Low Flow (1Q10): not applicable to tidal discharges
30-Day, 5-Year Low Flow (30Q5): not applicable to tidal discharges
30-Day, 10-Year Low Flow (30Q10): not applicable to tidal discharges
Harmonic Mean Flow (HM): not applicable to tidal discharges
Tidal? Yes
On 303(d) list? Yes
7. Operator License Requirements: Class 3
8. Reliability Class: I
9. Permit Characterization:
(X) Existing Discharge (X) Municipal
(X) Reissuance (X) Discharge to 303(d) Listed Segment
(X) Water Quality Limited (X) Effluent Limited
(X) PVOTW

10. Wastewater Flow and Treatment: Table 1

Outfall Number	Wastewater Source	Treatment	Design Flow
001	Resort hotel	Comminutor, pump station, influent equalization basin, duplex sequencing batch reactors, chlorine contact tank with tablet chlorination and dechlorination, effluent flow meter and aerobic digestion. The outfall is equipped with a multi-port diffuser.	0.0495 MGD

See **Attachment A** for a flow diagram. Allen Hall, the operator, confirmed that the plant does have the capability for post aeration; however, it is disconnected because the plant has been able to produce sufficiently aerated effluent without it. There is also a bar screen with the comminutor that is not hooked up as well.

11. Sludge Disposal: Liquid sludge is transported by a contract hauler, R & R Septic Service, to their septage lagoon in Gloucester, Va. for disposal. Septage lagoons are permitted by the VDH.

12. Discharge Location Description: This facility discharges to Carter Creek.
Name of USGS topo map: Irvington quadrangle – 122B (See **Attachment B**)

13. Material Storage: Chemicals are stored in proper containers and under roof cover.

14. Ambient Water Quality Information: Ambient water quality data from a downstream station at river mile 3-CTR000.76 used in this analysis; this station is located at the pier at the end of Crockett's Lane, approximately 0.4 mile downstream from the outfall. See **Attachment C** for the Ambient Stream Data, which includes TMDL information and Flow Frequency Determination.

15. Antidegradation Review and Comments:

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect those uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The anti-degradation review begins with a Tier determination. The receiving waterbody, Carter Creek, is determined to be a Tier 2 waterbody. Although Carter Creek is considered impaired of the Aquatic Life Use, the impairment is due to segment-wide low dissolved oxygen and is not necessarily indicative of local water quality. Review of the data from station 3-CTR000.76 indicates only 2 dissolved oxygen values below the 30-day mean water quality standard out of 50 samples. In addition, both values were above the instantaneous and 7-day mean water quality standards. Due to this, Carter Creek should be considered a Tier 2 water.

16. Site Inspection: July 5, 2012 by Heather Deihls. Site Visit: February 9, 2015 by Laura Galli. See **Attachment D**.

17. Effluent Screening & Limitation Development:

Table 2: 0.0495 MGD Facility

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS					
		MO AVG		WE AVG		MIN	MAX
Flow	NA	NL				NA	NL
pH	1, 5	NA		NA		6.0 S.U.	9.0 S.U.
BOD ₅	2	24 mg/L	4500 g/d	36 mg/L	6700 g/d	NA	NA
Total Suspended Solids (TSS)	4	24 mg/L	4500 g/d	36 mg/L	6700 g/d	NA	NA
Ammonia as N	3	0.99 mg/L		1.45 mg/L		NA	NA
Dissolved Oxygen (DO)	4	NA		NA		5.0 mg/L	NA
Total Residual Chlorine (TRC)	3	40 µg/L		45 µg/L		NA	NA
Total Recoverable Copper	3	70 µg/L		70 µg/L		NA	NA
Enterococci (geometric mean)	1	35 N/100mL		NA		NA	NA
Fecal Coliform (geometric mean)	4	200 N/ 100 ml		NA		NA	NA

1. Water Quality Standards (9 VAC 25-260)
2. Carter Creek Model
3. Water Quality Based Effluent Limitations
4. Best Professional Judgment
5. Federal Effluent Guidelines

Limitation Rationale for BOD₅, TSS, DO and Bacteria

pH: A pH limitation of 6.0-9.0 Standard Units is assigned to all Class II waters in accordance with VA Water Quality Standards, 9VAC 25-260-50, and federal secondary treatment standard guidelines.

BOD₅, TSS: These limits were carried forward based on the 1991 regional tidal model evaluated when the facility expanded to 0.0495 MGD BOD₅ and TKN/NBOD inputs for Carter Creek facilities were accounted for and the model was found to show that dissolved oxygen standards were maintained locally in Carter Creek (See **Attachment G**).

DO: The Dissolved Oxygen final limitation is being carried forward to the 2015 permit based on Best Professional Judgment to protect local water quality.

Enterococci: All sewage discharges must be disinfected to achieve applicable bacterial concentrations in accordance with VA Water Quality Standards, 9 VAC 25-260-170. Enterococci are the bacterial indicator for sewage effluents to salt water. 9 VAC 25-260-170 indicates a monthly geometric mean of 35 N/100ml in saltwater shall apply in all primary contact recreational uses in surface waters. This limitation is applied at a reduced frequency in accordance with the WPM decision from November 2014. Although a demonstration study was performed in 2004 to show that TRC was an acceptable surrogate parameter to demonstrate disinfection, EPA has since objected to the use of surrogate parameters when a water quality standard exists.

Fecal Coliform: Fecal coliform sampling is necessary to maintain in the permit because of the discharge to shellfish waters. For sewage effluents discharging to shellfish waters, permits limit fecal coliform with an effluent limit of 200 colony forming units (CFU) per 100 milliliters, applied as a monthly geometric mean. Although the Water Quality Standards have been amended to

remove the reference to this effluent limit in shellfish waters, the Virginia Department of Health, Division of Shellfish Sanitation still uses fecal coliform as an indicator for determining the quality of shellfish waters, and it is necessary to ensure discharges meet this level. Since it has historically maintained the in-stream water quality criteria for fecal coliform of 14/43 CFU per 100 milliliters, the 200 CFU per 100 milliliters effluent limit will be used in shellfish waters in order to continue meeting the in-stream criteria and for protection of shellfish under the general standard.

Water Quality Based Effluent Evaluations:

For all other parameters determined to be present in the facility's discharge, a Reasonable Potential Analysis must be conducted in order to determine if it is statistically probable that future discharges may contain that pollutant in concentrations which are harmful to the aquatic life or human health within the receiving stream. The first step of the analysis is determining the maximum concentration that may be discharged by the facility which will maintain the instream acute and chronic criteria contained in the *Virginia Water Quality Standards* (9 VAC 25-260 et.seq.). This maximum allowable pollutant concentration, called a wasteload allocation (WLA), is determined using a DEQ-created Excel spreadsheet deemed MSTRANTI, which requires inputs representing critical flow & water quality data for both the effluent and the receiving stream. The second step of the analysis utilizes another computer application named STATS.exe to calculate the lognormal distribution of the identified pollutant concentration using data submitted by the permittee as a sample set. The average and maximum 97th percentiles of the distribution are calculated and then compared to the WLA's determined earlier. If the 97th percentiles exceed the WLA's, a limitation is deemed to be necessary, which is also calculated by STATS.exe based on EPA-guidelines for the control of toxic pollutants. See **Attachments E and F**.

For Total Residual Chlorine, GM 00-2011 requires that a concentration of 20,000 µg/L be entered into STATS.exe as a data point in order to "bypass" the program's Reasonable Potential Analysis and calculate limitations since this pollutant is purposely introduced into the effluent as its disinfection method. Please note that the wasteload allocations entered into STATS for the TRC limit are actually for Chlorine Producing Oxidants (CPO). Chlorinated effluents discharged to salt water reacts to produce chlorine-produced oxidants (CPO) that have a toxic impact similar to TRC in freshwater. It is assumed that CPO in salt water receiving streams are controlled by the effluent TRC limit and that a 1:1 ratio is appropriate.

NH₃: In accordance with Guidance Memorandum 00-2011, an empirical concentration of 9 mg/L for ammonia was used as this is the expected value in domestic effluents. This concentration and the acute and chronic WLAs obtained through MSTRANTI were entered into STATS, and the analysis shows that water quality based effluent limitations are needed based on chronic toxicity. The limitations obtained in the evaluation shown in **Attachment F** are the same as the 2010 limitations.

TRC (005): Chlorine and chlorine produced oxidants (CPO) are toxicants purposefully introduced into the effluent and are known to be present in the effluent; therefore, all chlorinated effluents must have a chlorine and/or CPO limit. In accordance with GM00-2011, a concentration of 20,000 µg/L is used for the calculation of effluent limitations in STATS (see **Attachment F**). The limitations were determined to be 40 µg/L monthly average and 45 µg/L weekly average, which are the same as the 2010 permit.

TRC (157 and 213): Limits are carried forward from the 2010 permit. See Item #19 for special condition rationale and Part I.B of the permit (Additional Chlorine Limitations and Monitoring Requirements).

Other Parameters: The facility reported detectable data for Chloroform and Dichlorobromomethane. Because there are no aquatic life criteria established for Chloroform, and Dichlorobromomethane, these parameters were compared with the human health wasteload allocations from MSTRANTI; both parameter concentrations are well below the respective human health WLAs.

Although no STATS analysis was performed for dissolved copper at this time since the concentration provided with the application was below the quantification level, total recoverable copper was detected regularly from 2010 through 2014. Therefore, the current limit for total recoverable copper will be carried forward in the 2015 permit.

All other parameters were reported below DEQ required quantification levels and thus considered absent for the purposes of this evaluation.

18. Antibacksliding: All limitations in the proposed permit are the same or more stringent than the limitations in the permit reissued in 2010.
19. Additional Chlorine Limitations and Monitoring Requirements – Part I.B.
Required by Sewage Collection and Treatment Regulations, 9VAC25-790. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This special condition ensures proper operation of chlorination equipment to maintain adequate disinfection.
20. Special Conditions – Part I.C:
 - a. I.C.1 – 95% Capacity Reopener
Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 4 for all POTW and PVOTW permits.
 - b. I.C.2 – O&M Manual Requirement
Rationale: Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulation, 9 VAC 25-31-190 E.
 - c. I.C.3 – Licensed Operator Requirement
Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 C and the Code of Virginia § 54.1-2300 et seq., Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18 VAC 160-20-10 et seq.), require licensure of operators.
 - d. I.C.4. – Reliability Class
Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790 for all municipal facilities.
 - e. I.C.5 – Sludge Use and Disposal
Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 P, 220 B 2, and 420 through 720; and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal.
 - f. I.C.6. – Sludge Reopener
Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-220 C for all permits issued to treatment works treating domestic sewage.
 - g. I.C.7 – Compliance Reporting
Rationale: Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limitation or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.
 - h. I.C.8 – Materials Handling/Storage
Rationale: 9 VAC 25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and 62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

- i. I.C.9 – Nutrient Reopener
9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.
 - j. I.C.10 – CTO, CTC Requirement
Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790. 9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.
 - k. I.C. 11 – Indirect Dischargers
Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works. This condition is included in the 2015 permit because of past problems at the plant due to accepting boat waste.
 - l. I.C.13. – Closure Plan
Rationale: This condition establishes the requirement to submit a closure plan for the treatment works if the treatment facility is being replaced or is expected to close. This is necessary to ensure treatment works are properly closed so that the risk of untreated wastewater discharge, spills, leaks and exposure to raw materials is eliminated and water quality maintained. Section 62.1-44.21 requires every owner to furnish when requested plans, specification, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purpose of the State Water Control Law.
20. Part II, Conditions Applicable to All VPDES Permits
The VPDES Permit Regulation at 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.
21. Changes to the 2010 Permit

Table 3: Permit Processing Change Sheet

Parameter Changed	Effluent Limits Changed		Monitoring Frequency Changed		Reason for Change	Date
	From	To	From	To		
Enterococci	-	35 N/100mL	-	4 per Year	Added in accordance with WQS and EPA objection to the use of surrogate parameters when a WQS exists.	2/15
The cover page was revised to update the VPDES Permit Manager Title and to modify the receiving stream name to Carter Creek (See Attachment C).						

From	To	Special Condition Changed	Reason for Change	Date
I.B	I.B	Additional TRC Monitoring	Revised in accordance with GM14-2003.	1/15
I.C	I.C	I.C.1 through I.C.13	Added special conditions labels for clarity.	1/15
I.C.2	I.C.2	O&M Manual Requirements	Revised in accordance with GM14-2003.	1/15
I.C.3	I.C.3	Licensed Operator Requirements	Revised in accordance with GM14-2003.	1/15
I.C.5	I.C.5	Sludge Use and Disposal	Revised in accordance with GM14-2003.	1/15
I.C.7	I.C.7	Compliance Reporting	Revised quantification levels and language in accordance with GM14-2003.	1/15

From	To	Special Condition Changed	Reason for Change	Date
I.C.8	I.C.8	Materials Handling/Storage	Revised in accordance with GM14-2003.	1/15
I.C.9	I.C.9	Nutrient Reopener	Added additional reopeners in accordance with GM07-2008 Amendment 2.	2/15
I.C.10	I.C.10	CTC, CTO Requirements	Revised in accordance with GM14-2003 and GM07-2008 Amendment 2.	1/15
I.C.12	-	Water Quality Criteria Reopener	No longer relevant because there are no parameters monitored without limitations in the permit.	2/15
I.C.13	I.C.12	Closure Plan	Revised in accordance with GM14-2003.	1/15
Part II	Part II	Conditions Applicable to all VPDES Permits	Revised in accordance with GM14-2003.	1/15

24. Variances/Alternate Limits or Conditions: None.

25. Public Notice Information required by 9 VAC 25-31-280 B:

Publishing Newspaper: The Rappahannock Record

Comment period: Start Date: March 5, 2015 End Date: April 6, 2015

Publication dates: March 5, 2015 and March 12, 2015

All pertinent information is on file and may be inspected or copied by contacting Laura Galli at:

Virginia Department of Environmental Quality (DEQ)

Piedmont Regional Office

4949-A Cox Road

Glen Allen, Virginia 23060-6296

Telephone Number 804-527-5095

Facsimile Number 804-527-5106

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Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may review the draft permit and application at the DEQ Piedmont Regional Office by appointment.

26. Total Maximum Daily Load: During the 2012 305(b)/303(d) Integrated Water Quality Assessment, Carter Creek was assessed as a Category 4A water ("Impaired or threatened for one or more designated uses but does not require a TMDL because the TMDL for specific pollutant(s) is complete and US EPA approved.") The mesohaline portion of the Rappahannock River estuary, which includes Carter Creek, is impaired for dissolved oxygen due to EPA policy based on the previous failure of the Chesapeake Bay 30-day open water summer dissolved oxygen criteria. Carter Creek was fully supporting of the Recreation, Fish Consumption and Wildlife Uses. The Shellfish Use is not applicable in this segment because it is within a VDH Prohibited Zone; therefore the Use is considered to be removed.

This facility discharges directly to Carter Creek in the Chesapeake Bay Watershed. The receiving stream has been addressed in the Chesapeake Bay TMDL, approved by EPA on December 29, 2010. The TMDL addresses dissolved oxygen (DO), chlorophyll a, and submerged aquatic vegetation (SAV) impairments in the main stem Chesapeake Bay and its tidal tributaries by establishing non-point source load allocations (LAs) and point-source waste load allocations (WLAs) for Total Nitrogen (TN), Total Phosphorus (TP) and Total Suspended Solids (TSS) to meet applicable Virginia Water Quality Standards contained in 9VAC25-260-185.

Implementation of the Chesapeake Bay TMDL is currently accomplished in accordance with the Commonwealth of Virginia's Phase I Watershed Implementation Plan (WIP), approved by EPA on December 29, 2010. The approved WIP recognizes the "General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed of Virginia" (9VAC25-820) as controlling the nutrient allocations for non-significant Chesapeake Bay dischargers. The approved WIP states that for non-significant Municipal and Industrial facilities, nutrient WLAs are to be consistent with Code of Virginia procedures, which set baseline WLAs to 2005 permitted design capacity nutrient load levels. In accordance with the WIP, TN and TP WLAs for non-significant facilities are considered aggregate allocations and will not be included in individual permits. The WIP also considers TSS WLAs for non-significant facilities to be aggregate allocations, but TSS limits are to be included in individual VPDES permits in conformance with the technology-based requirements of the Clean Water Act. However, the WIP recognizes that so long as the aggregated TSS permitted loads for all dischargers is less than the aggregated TSS load in the WIP, the individual permit will be consistent with the TMDL.

40 CFR 122.44(d)(1)(vii)(B) requires permits to be written with effluent limits necessary to meet water quality standards and to be consistent with the assumptions and requirements of applicable WLAs. This facility is considered a Non-significant Chesapeake Bay discharger because it is an existing facility with a permitted design capacity flow of less than 100,000 gallons per day into tidal waters. This facility has not made application for a new or expanded discharge since 2005. It is therefore covered by rule under the 9VAC25-820 regulation. In accordance with the WIP, TN and TP load limits are not included in this individual permit, but are consistent with the TMDL because the current nutrient loads are in conformance with the facility's 2005 permitted design capacity loads. This individual permit includes TSS limits of 24 mg/L that are in conformance with technology-based requirements and, in turn, are consistent with the Chesapeake Bay TMDL. In addition, the individual permit has a minimum limit for DO of 5 mg/L. Given these limits, this facility can neither cause nor contribute to an observed violation of the standards, and is consistent with the TMDL.

27. Additional Comments:

a. Previous Board Action: None.

b. Staff Comments:

- This permit reissuance is non-controversial. Staff believes that the attached effluent limitations will maintain the Water Quality Standards adopted by the Board.
- The discharge is in conformance with the existing planning documents for the area.
- Reduced monitoring is not appropriate at this time because this is a seasonal discharge. The facility closes after December until the spring and there is minimal discharge during the winter months.
- This permit reissuance is not subject to the nutrient monitoring requirements associated with GM14-2011 as the permittee has monitored and reported for nutrients concentrations during the 2005 permit cycle. This monitoring data has been deemed by DEQ Central Office staff as still representative of the discharge; therefore, no additional monitoring for these parameters is necessary.
- The permittee does not participate in the Virginia Environmental Excellence Program (VEEP).

- Financial assurance does not apply to this facility as this facility does not have a design flow less than 40,000 gpd. Additionally, if the “owner” abandoned the facility, the resort and the STP would close, and flow to the wastewater plant would cease. The need for DEQ to ensure a temporary continuation of services would not exist and thus, neither would the need for financial assurance.
- The permit maintenance fee was deposited on December 15, 2014.
- The facility is currently enrolled in the eDMR program. Enrollment date: 05/04/2010.
- Local government officials were notified of the public comment period on March 2, 2015. In accordance with the Code of Virginia, §62.1-44.15:01, the following individuals received the notification: Mr. Jason Bellows, Board of Supervisors Chairman; Mr. Frank Pleva, Lancaster County Administrator; Mr. Stewart McKenzie, Northern Neck Planning District Commission.

c. Other Agency Comments: see **Attachment H** for VDH and USFWS comments.

d. Owner Comments: None

28. Summary of attachments to this Fact Sheet:

Attachment A	Facility Diagram
Attachment B	Site Map
Attachment C	Flow Frequency Memorandum and Ambient Data
Attachment D	Site Inspection and Site Visit Reports
Attachment E	Effluent Data
Attachment F	MSTRANTI and STATS Outputs
Attachment G	Diffuser Calculations and Stream Model
Attachment H	VDH and USFWS Coordination Responses